

# Accuracy of non-radiologists and laypeople for identifying children with cerebral cortical atrophy from 'Mercator map' curved reconstructions of the brain



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**Background:** Communication of cortical brain atrophy in children with term hypoxic-ischaemic injury (HII) to parents and the legal fraternity contesting compensation rights can be very difficult using text and standard cross-sectional images. When demonstrating the cortex in HII, a single image of the brain surface, much like the way a map of the earth is derived from a globe, can be generated from curved reconstruction of coronal magnetic resonance imaging (MRI) scans, that is, a Mercator map. Laypeople's ability to identify abnormal scans from such maps without prior training requires evaluation before routine use.

**Aim:** To determine the sensitivity and specificity of laypeople in detecting abnormal brain scans through review of Mercator flat-earth maps of the brain, without prior training.

**Methods and materials:** Ten Mercator map images were provided to 100 participants with a distribution of 5 HII, 1 cortical dysplasia and 4 reported normal. Participants were required to identify abnormal scans. Sensitivity and specificity overall and for sub-groups were derived by averaging true positives and true negatives and false positives and false negatives.

**Results and conclusion:** The results show a strong ability for laypeople to identify normal versus abnormal MRI brain studies using Mercator maps. The sensitivity and specificity in this group is 67% and 73%, respectively. Non-radiologist physicians and radiographers performed slightly better than laypeople as expected. Radiologists of course, had very high sensitivity and specificity of 86% and 100%. The Mercator map is therefore a viable tool in the communication of complex MR imaging to the layperson.

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**Note:** A selection of conference abstracts: RSSA/SASPI Paediatric Imaging Congress, 03–06 November 2016, Spier Estate, Stellenbosch, South Africa. Faculty collaborators: Professor Kassa Darge (Body Imaging, University of Pennsylvania, Philadelphia, USA), Professor Edward Lee (Thoracic Imaging, Harvard University, USA), Professor Beverley Newman (Cardiac Imaging, Stanford University, California, USA), Professor Kimberly Applegate (Image Gently and Body Imaging, Emory University, Atlanta, USA) and Professor Savvas Andronikou (Thoracic Imaging, University of Bristol, UK) supported by South African Paediatric Radiologists, co-ordinated by Dr Jaishree Naidoo, President of the African Society of Paediatric Imaging and Head of Division of Paediatric Radiology, Charlotte Maxeke Johannesburg Academic Hospital.

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